Matteo Riondato

CONTACTS

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RESEARCH INTERESTS

Data analytics, graph mining, randomized algorithms, social network analysis, algorithms for distributed/parallel architectures for big data, privacy issues in data analysis, statistical learning theory.

EDUCATION

Brown University, Providence, Rhode Island, USA
Ph.D., Computer Science, *in progress since September 2009*. Expected completion: May 2014
- Doctoral Dissertation: *Randomized algorithms for big data analytics*
- Advisor: Prof. Eli Upfal

M.S., Computer Science, May 2010

Università di Padova, Padua, Italy
Laurea Magistrale (M.S.) 110/110 *cum laude*, Computer Engineering, July 2009
- Master Thesis: *Top-k frequent itemsets mining through sampling*
- Advisors: Prof. Andrea Pietracaprina, Prof. Eli Upfal, Fabio Vandin

Laurea (B.S.), Information Engineering, July 2007
- Final Project: *Algorithmical foundations of cryptography*
- Advisor: Prof. Andrea Pietracaprina

PUBLICATIONS

[8] M. Riondato and E. M. Kornaropoulos. Fast estimation of betweenness centrality through sampling. In Proceedings of the Seventh International Conference on Web Search and Web Data Mining, WSDM 2014, New York, NY, USA, February 24 – 28, 2014, ACM, 2014 (*to appear*).

[7] M. Riondato, J. A. DeBrabant, R. Fonseca, and E. Upfal. PARMA: A parallel randomized algorithm for association rules mining in MapReduce. In X.-w. Chen, G. Lebanon, H. Wang, and M. J. Zaki, editors, *Proceedings of the 21st ACM International Conference on Information and Knowledge Management, CIKM 2012, October 29 – November 02, 2012, Maui, HI, USA*, pages 85–94. ACM, 2012.

[6] M. Riondato and E. Upfal. Efficient discovery of association rules and frequent itemsets through sampling with tight performance guarantees. In P. A. Flach, T. De Bie, and N. Cristianini, editors, *Machine Learning and Knowledge Discovery in Databases*, volume 7523 of *Lecture Notes in Computer Science*, pages 25–41. Springer, 2012.

[5] A. Pietracaprina, G. Pucci, M. Riondato, F. Silvestri, and E. Upfal. Space-round tradeoffs for MapReduce computationseduce computations. In U. Banerjee, K. A. Gallivan, G. Bilardi, and M. Katevenis, editors, *International Conference on Supercomputing, ICS 2012, Venice, Italy, June 25–29, 2012*, pages 235–244. ACM, 2012.

[4] M. Akdere, U. Çetintemel, M. Riondato, E. Upfal, and S. B. Zdonik. Learning-based query performance modeling and prediction. In *Proceedings of the 28th International Conference on Data Engineering, ICDE 2012, April 1–5, 2012, Washington, DC, USA*, pages 390–401. IEEE Computer Society, 2012.

[3] M. Riondato, M. Akdere, U. Çetintemel, S. B. Zdonik, and E. Upfal. The VC-dimension of SQL queries and selectivity estimation through sampling. In D. Gunopulos, T. Hofmann, D. Malerba, and M. Vazirgiannis, editors, *Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2011, Athens, Greece, September 5–9, 2011, Proceedings, Part II*, volume 6912 of *Lecture Notes in Computer Science*, pages 661–676. Springer, 2011.

[2] M. Akdere, U. Çetintemel, M. Riondato, E. Upfal, and S. B. Zdonik. The case for predictive database systems: Opportunities and challenges. In *CIDR 2011, Fifth Biennial Conference on Innovative Data Systems Research, Asilomar, CA, USA, January 9–12, 2011, Online Proceedings*, pages 167–174. www.cidrdb.org, 2011.

[1] A. Pietracaprina, M. Riondato, E. Upfal, and F. Vandin. Mining top-k frequent itemsets through progressive sampling. *Data Mining and Knowledge Discovery*, 21(2):310–326, 2010.

UNDER SUBMISSION / IN PREPARATION

[9] A. Anagnastopoulos, L. Becchetti, A. Fazzone, I. Mele, and M. Riondato. The importance of being experts: Efficient max-finding in crowdsourcing.

[10] M. Riondato, D. García-Soriano, and F. Bonchi. Graph summarization with guarantees.

[11] M. Riondato and F. Vandin. Finding the true frequent itemsets.

[12] M. Riondato and E. Upfal. Efficient discovery of association rules and frequent itemsets through sampling with tight performance guarantees (extended version).

[13] M. Riondato, M. Akdere, U. Çetintemel, S. B. Zdonik, and E. Upfal. The VC-dimension of SQL queries and selectivity estimation through sampling (extended version).

AWARDS

Brown University Dissertation Fellowship **Fall 2013**

Yahoo! Research Summer Internship **Summer 2013**

Research Fellowship from MIUR of Italy under Project AlgoDeep prot. 2008TFBWL4 **Summer 2011**

Brown University Graduate Fellowship **Academic Year 2009–10**

INVITED TALKS

Fast betweenness estimation through sampling. *Data Management Group Seminar, Boston University*, 10/17/2013.

Fast betweenness estimation through sampling. *Lab Research Seminar, Yahoo! Labs Barcelona*, 6/13/2013.

Fast betweenness estimation through sampling. *Advanced Computing Group Talk, Department of Information Engineering, University of Padua, Italy*, 5/30/2013.

Statistical learning theory meets knowledge discovery: Randomized algorithms for Big Data analytics. *Brown CS Industrial Partners Program Symposium*, 4/25/2013.

Approximate aggregate database queries through sampling. *Invited Lecture for CSCI-2950-T, Brown University*, 10/25/2011.

Graphs algorithms in MapReduce: Design choices and optimizations. *Invited Lecture for CSCI-2950-U, Brown University*, 9/27/2011.

Statistical learning theory meets databases. *Advanced Computing Group Talk, Department of Information Engineering, University of Padua, Italy*, 06/24/2011.

Top-k frequent itemsets mining through sampling. *Advanced Computing Group Talk, Department of Information Engineering, University of Padua, Italy*, 9/16/2010.

ADDITIONAL RESEARCH EXPERIENCE

Yahoo! Labs, Barcelona, Spain
Summer Intern Research Scientist in the Web Mining Group **June – August 2013**

- Worked with Dr. Francesco Bonchi and others on algorithms for graph summarization and for frequent itemsets mining from data streams in a distributed setting.

Summer School on Massive Data Mining, Copenhagen, Denmark
Student **August 8 – 10, 2012**

- Attended the Summer School on Massive Data Mining organized by Prof. R. Pagh at IT University of Copenhagen.

Sapienza Università di Roma, Rome, Italy
Visiting Ph.D. Student **June – July 2012**

- Worked with Prof. S. Leonardi, A. Anagnostopoulos, and L. Becchetti on algorithms for a model of crowdsourcing computation, and on algorithms for MapReduce.

Università di Padova, Padua, Italy
Research Fellow **May – July 2011**

- Worked with Prof. A. Pietracaprina, G. Pucci, and F. Silvestri on "The MapReduce Paradigm: computational model and algorithms". Funded by MIUR of Italy under Project AlgoDEEP prot. 2008TFBWL4.

Chalmers University of Technology, Gothemburg, Sweden
Visiting Ph.D. Student **August 2010**

- Worked with Prof. Devdatt Dubhashi and helped organize a seminar on Probability and Computing.

Brown University, Providence, RI, USA
Visiting Grad Student **October 2008 – June 2009**

- Worked with Prof. Eli Upfal on master thesis *Top-K Frequent Itemsets Mining through Sampling*.

Teaching Training and Experience

The Harriet W. Sheridan Center for Teaching and Learning (Brown University), Providence, RI, USA

- Teaching Certificate I: Reflective Learning, AY 2013–14

Brown University, Providence, Rhode Island, USA

- Teaching Assistant, Probability and Computing, Spring 2012, Spring 2013, Spring 2014
- Teaching Assistant, Probabilistic Methods in Computer Science, Fall 2010

Service

External/Sub- reviewer for the following conferences

- RANDOM'11, ICS'12, IPDPS'12, WSDM'13, MFCS'13, BigData'13, WSDM'14.

Brown University Graduate Student Council
President **April 2011 – December 2012**

- Represented the interests of the entire graduate student community (approx. 2000 students) with the university administration and the broader community at all levels. Previously held positions include Vice-President of Administration (Jan. – April 2011) and representative for the Computer Science Department (Sept. 2009 – April 2011, Jan 2013 – *ongoing*).

Brown University Graduate Council
Student Representative **September 2011 – May 2013**

- Represented the interests of the graduate student community in the highest body governing graduate education at Brown University.

Brown University Strategic Planning Committee on Doctoral Education
Student Representative **September 2012 – May 2013**

- Represented the interests of the graduate student community to develop the presidential strategic plan for Brown University.

Brown Computer Science Theory Lunch
Organizer **January – December 2010**

- Responsible for organizing the weekly meeting of the Theory Group.

Software

CentrSampl

- Algorithm to estimate node betweenness centrality in large graphs. Based on [8]. `http://www.cs.brown.edu/~matteo/centrsampl.tar.bz2`.

PARMA

- Frequent itemsets and association rules mining algorithm for Hadoop MapReduce. Based on [7]. `http://www.cs.brown.edu/~matteo/parma.tar.bz2`.

FreeSBIE
Developer, Release Engineer for the 2.x series **April 2004 – July 2009**

- Developed FreeSBIE, a Live-CD distribution of FreeBSD bootable from CD-ROM. Release Engineer for FreeSBIE 2.X. series, responsible for all aspects of the release. `http://www.FreeSBIE.org`.

The FreeBSD Project
src Committer **January 2006 – June 2013**

- Contributed to the development of the FreeBSD UNIX operating system. Granted write access to the main source repository. Worked on the `jail` security feature and on handling and solving bug reports of various nature. Author of the *Jail* chapter in the FreeBSD Handbook. `http://www.FreeBSD.org`.

References

Prof. Eli Upfal	Prof. Uğur Çetintemel	Dr. Francesco Bonchi
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Up-to-date version

Available from `http://www.cs.brown.edu/~matteo/matteo_riondato_cv.pdf`